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Most Accurate Measurement of the Antineutrino Flux Emitted by the Fission of 235U from the Absolute Normalization of the STEREO Experiment

The STEREO experiment measures the antineutrinos emitted by the reactor of the Institut Laue-Langevin (ILL) in Grenoble-France. The detector is installed at 10m from the 58 MW core operating a highly-enriched nuclear fuel, which allows a direct measurement of antineutrinos from fission of pure 235U. In this poster, we discuss the developments achieved to control the main sources of uncertainty of the absolute normalization. This includes the measurement of the proton number, the full propagation of uncertainties through the procedure of the thermal power measurement, the dedicated simulations of the corrections to the reference Huber spectrum and the use of the FIFRELIN code to achieve a high quality description of the gamma-cascades from the n-captures on Gadolinium. We achieve the most accurate measurement to date of the antineutrino rate from the fission of 235U and find a deficit compatible with the Reactor Antineutrino Anomaly.

Mini-abstract

STEREO reports the most accurate measurement of the antineutrino rate from the fission of pure-235U.

Experiment/Collaboration

STEREO

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